

PATENT

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ABSTRACT OF THE DISCLOSURE

A system for performing PVD of metallic nitride(s) is disclosed. The improved performance is provided by a method of increasing the partial pressures of nitrogen or other active gases near the wafer surface through initial introduction of the argon or other neutral gases alone into an ionized metal plasma PVD chamber through an upper gas inlet at or near the target, initiating the plasma in the presence of argon or other neutral gases alone, after which nitrogen or other active gases are introduced into the chamber through a lower gas inlet at or near the wafer surface to increase deposition rates and lower electrical resistivity of the deposited metallic layer. An apparatus for carrying out the invention includes a source of argon near the target surface and a source of nitrogen integral to the substrate support thereby delivering nitrogen near the substrate surface.

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